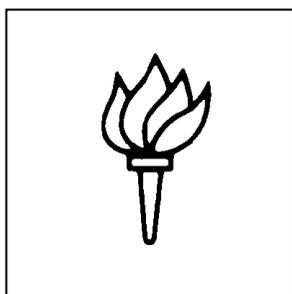# NEW YORK UNIVERSITY SCHOOL OF LAW

NYU Center for Law, Economics and Organization

Human Trafficking and Regulating Prostitution

Samuel Lee and Petra Persson

July 2012

Human Trafficking and Regulating Prostitution*

Samuel Lee   Petra Persson

July 20, 2012

Abstract

This paper studies the effect of prostitution laws on human trafficking and voluntary prostitution. We argue theoretically that neither legalization nor criminalization can simultaneously protect voluntary prostitutes and unambiguously reduce trafficking. We propose that providing a "safe harbor" for voluntary sex workers is the most, possibly the only, effective way to eradicate trafficking and suggest a simple but novel policy: regulated prostitution with severe criminalization of johns who purchase sex elsewhere. This policy restores the free market outcome that arises in the absence of trafficking. If the aim is to combat prostitution in general, the optimal policy criminalizes all johns. We consider cross-border trafficking, sex tourism, social norms, and political support for prostitution laws. The model predicts that the female-male income ratio is a key determinant of what share of prostitutes is trafficked, the political will to enact or enforce prostitution laws, and whether such laws increase or decrease trafficking.

Keywords: Prostitution, Sex Trafficking, Contemporary Slavery, Marriage, Criminalization

JEL Codes: D10, J16, J47, J49, K14, K23

*Samuel Lee, Stern School of Business, New York University, KMC 9-71, 44 West Fourth Street, New York, NY 10012, e-mail: slee@stern.nyu.edu; Petra Persson (corresponding author), Department of Economics, Columbia University, 420 West 118th Street, MC 3308, New York, NY 10027, tel: +1-917-216-7106, e-mail: pmp2116@columbia.edu.

Whatever one thinks of whether 18-year-olds should be able to sell sex, everyone can agree that 14-year-olds shouldn't be imprisoned inside brothels. – Nicholas D. Kristof

1. Introduction

Laws against prostitution endanger prostitutes by forcing them to the streets and by depriving them of opportunities to get regular health check-ups, organize, or seek help from the police. Citing such concerns for prostitutes' safety, a Canadian court recently struck down laws banning brothels (Austen 2012). However, opponents argue that such legalization increases sex trafficking and exploitation. The experience of Spain, where prostitution is de facto legal, seems to support this view: The country is believed to have become a magnet for sex trafficking and sex tourists (Daley 2012). Yet others argue that criminalization fails to reduce trafficking and only makes matters worse by driving the market for commercial sex underground.

Disagreement on the optimal regulation of prostitution is reflected in the regulatory systems around the world, illustrated in Table 1, which range from general criminalization, criminalization of only the prostitute or only the john, to legalization with various restrictions. A series of articles published on April 19 in the *New York Times* under the heading "Is Prostitution Safer When It's Legal?" displays a similarly wide array of views on the optimal regulation of prostitution in the United States.[1]

Table 1

But there is also agreement. Barring moral paternalism, many concur that it is crucial to distinguish prostitutes who work of their own free will from victims of sex trafficking or exploitation (Weitzer 2012). The key question is thus: Can we design a regulatory framework that protects the safety and wellbeing of voluntary prostitutes while minimizing the scope for traffickers to exploit women and girls in involuntary prostitution? Put differently, can we, in the presence of traffickers, find a regulatory policy that restores the free market outcome that would result, under legality, in the absence of traffickers? Establishing such a policy would help spare some of the 600,000 individuals who are estimated to be trafficked each year for commercial sexual purposes, within and across borders throughout the world, a figure that corresponds to one woman or child every 60 seconds (Kara 2009).[2]

---

[1] Table 1 is based on descriptions of international prostitutions laws provided by ProCon at http://prostitution.procon.org/view.resource.php?resourceID=000772.

[2] Because of the clandestine nature of trafficking, estimates on the number of trafficking victims vary and

This paper addresses this question using the tools of economic theory. We develop a model that builds on the seminal work of Edlund and Korn (2002) on voluntary prostitution. Under the assumption that serving as a prostitute reduces a woman's ability to marry, the authors model a woman's decision to enter prostitution: On one hand, selling sex generates income; on the other hand, it forces her to give up other work as well as the benefits of marriage. Those who enter prostitution voluntarily must thus be paid a premium that compensates for these opportunity costs.

Our innovation is to add to this framework the free entry of human traffickers who, at a cost, can abduct women and force them into prostitution. On the sex market, trafficked, or involuntary, prostitutes sell sex at competitive prices but their revenues are extorted by their traffickers. In this framework we analyze the effect of different regulatory policies on the supply of voluntary and involuntary prostitutes, on johns' demand, and on the price of commercial sex.[3]

Our analysis shows that neither criminalization nor legalization is unambiguously superior in combating trafficking. Either policy can increase or decrease trafficking, depending on the prevalence of voluntary prostitution, which in turn depends on factors such as female-male income disparities. Moreover, even when criminalization reduces trafficking, it pits the prevention of trafficking against the interests of voluntary sex workers, creating a conflict that is often at the center of intense public debates. But our main result is that there exists an alternative policy that can achieve both objectives at the same time. In fact, given the competition between suppliers of sex, we show that safeguarding voluntary sex work is instrumental, possibly even crucial, in eradicating trafficking—thus aligning the interests of advocates often found on opposite sides of the debate.

Legalization brings prostitution into the open. But it does not eliminate trafficking. As long as there is demand for commercial sex, traffickers find it profitable to enslave women and supply sex, thereby diverting business away from voluntary prostitutes and pushing down the price of sex. Thus not only do traffickers exploit their victims but they also profit at the expense of voluntary prostitutes. Criminalization—of the prostitute, the john, or both—drives prostitution underground, making it harder to get regular health check-ups,

---

are subject to much debate (Weitzer 2012). The number reported above are similar to recent estimates by the United States Department of Justice (2009).

[3]Throughout our analysis we assume that women sell and men buy sex on the commercial market; further, we restrict the purchase of sex to the purchase of physical services, ruling out the purchase of phone sex, pornography, lap dances, and so on. While men also choose to sell sex voluntarily, and while young men and boys are also victims of trafficking, the overwhelming majority of suppliers on the sex market are female (United Nations Office on Drugs and Crime 2009). While a simplification, our assumption thus essentially captures the reality of the market for sex. See Edlund and Korn (2002) for a more extensive motivating discussion.

enter business relationships, rent apartments, and so on. Because of such costs, voluntary prostitutes prefer legalization. Hence, the promise of criminalization can only be to reduce trafficking, and thereby to benefit (the spared) involuntary prostitutes. It turns out, however, that criminalizing prostitution is not a foolproof way to combat traffickers. Criminalization *may* deter trafficking, but it may also spur it.

Criminalization of the prostitute reduces voluntary prostitution since the risk of conviction, which entails both a loss of income and a criminal penalty, makes prostitution harsher. The trafficker is also affected, but less so: Conviction of a trafficked prostitute entails an income loss but the criminal penalty is typically borne by the victim. This policy thus deters voluntary prostitution more than trafficking. More alarmingly, because the exit of voluntary prostitutes puts upward pressure on the price of commercial sex, trafficking may even increase. In fact, since the criminal penalty mostly hits prostitutes, not traffickers, criminalization of the prostitute risks boosting trafficking precisely where penalties are harsh.

The so-called Swedish Model, now also adopted in Norway, Iceland, and South Korea, instead criminalizes johns but not prostitutes. This decreases demand for commercial sex. If all prostitutes are trafficked, the fall in demand induces a decrease in trafficking. So long as voluntary prostitution exists, however, it need not reduce trafficking: Criminalization raises men's valuation of marriage relative to sex, which causes some voluntary prostitutes to exit the market for sex since they now prefer to marry. This raises the price of commercial sex, which attracts more traffickers who do not internalize their victims' opportunity costs of foregone marriage.

The insight that emerges is that across-the-board criminalization first and foremost discourages voluntary prostitution. So long as some prostitution is voluntary, harsher laws can, at worst, cause trafficked prostitutes to replace exiting voluntary ones. To get at trafficking, all voluntary prostitution must be crowded out first. But trafficking may persist even then. Criminalizing the prostitutes cannot eradicate trafficking unless enforcement is perfect because it leaves demand unaffected and trafficking is profitable as long as there is demand. Criminalizing johns can eradicate trafficking, but only if none of the demand is inelastic. Neither approach—not even a combination of both—can eliminate trafficking when some buyers are difficult to deter (which Becker, Murphy, and Grossman [2006] argue is often the case for "illegal goods").

None of the above options, which dominate the current debate, are unequivocally superior in curbing trafficking. Further, criminalization pits the protection of voluntary prostitutes against the prevention of trafficking. The optimal regulation then depends crucially on how large a share of prostitution is involuntary; here disagreement is rampant (Weitzer 2012). Also in practice there is no clear-cut relation between prostitution laws and sex trafficking.

The top nine destinations for sex trafficking victims, as identified by the United Nations Office on Drugs and Crime (2006), span all the standard regulatory approaches (see Table 2).

Table 2

We propose an alternative policy: a combination of legal, regulated, and monitored prostitution with—and this is crucial—severe criminal penalties for johns who buy sex elsewhere. Our analysis suggests that this policy can simultaneously safeguard voluntary prostitutes and minimize trafficking.

For the sake of argument, suppose the government runs a hotel where prostitutes can work (it does not have to be the government that manages the hotel, but since monitoring will turn out to be key, this illustrates our point most clearly). Prostitutes must apply for a license to work there but, once admitted, price their services competitively and keep their income. Each applicant must undergo a background check, such as when applying for a visa, including identification, residence, age, and so forth. Arguably, no trafficked women apply. For brevity, let us refer to this arrangement as a "state-run brothel" (though the government does not extract any rents).

Simply creating such brothels would not reduce trafficking; other brothels would still emerge, employing both voluntary and involuntary prostitutes. But couple this with the prosecution of any john who purchases sex outside of a state-run brothel. Then all voluntary prostitutes would prefer to work in state-run brothels. The reason is simple: To attract men to illegal brothels, prices must be lower there to compensate for the risk of arrest. So voluntary prostitutes work where they earn the most, that is, in state-run brothels.

Once voluntary and involuntary prostitutes are separated, criminalizing the trade of sex outside of state-run brothels does not affect voluntary prostitutes. In this case, harsher restrictions are better. In fact, a sufficiently severe criminal penalty on johns who purchase illegal sex can eliminate all demand for illegal sex and thus eradicate trafficking. Crucially, penalizing illegal prostitutes cannot eradicate trafficking; as long as there is demand for illegal sex, it is profitable for traffickers to supply sex slaves. (Penalties on johns can accomplish more than penalties on prostitutes and do not unfairly penalize trafficking victims; penalties on johns are thus in general better.)

The intuition for this result lies in the fact that traffickers are driven by economic incentives. We can therefore combat trafficking only by reducing its profitability. But as long as criminalization reduces voluntary prostitution, it risks accomplishing the opposite; the exit of voluntary prostitutes can raise the price of commercial sex, which makes trafficking *more* profitable. An effective policy against trafficking *must* therefore provide a "safe harbor"

where voluntary prostitutes can work and absorb the demand for commercial sex when the machinery of criminalization drains demand from the involuntary sector. Indeed, this policy eradicates trafficking *even if some demand is inelastic* because this demand is met in the "safe harbor." Safeguarding the wellbeing of voluntary prostitutes is thus *instrumental* in eradicating business opportunities for involuntary prostitutes and thereby the "investment value" that an abducted woman or child constitutes to a trafficker.

While the policy is clearly more effective, an important question is whether it is more expensive than the currently prevailing approaches. Our analysis, like others on the regulation of illegal goods (Becker, Murphy, and Grossman 2006; Desierto and Nye, 2012), abstracts from the (exogenous) costs the government bears in implementing policies and focuses only on the (endogenous) costs the implemented policy imposes on the market participants—primarily because assumptions about implementation costs can be arbitrary. Of course, in practice, these costs matter. In Section 5, we argue that the costs of the "safe harbor" policy may be lower than those of alternative policies against trafficking, namely, outright criminalization of prostitution or law enforcement efforts targeted directly at trafficking activities.

We consider several extensions of the model. First, we consider a small open country in which the wage, and hence the opportunity cost, of domestic prostitutes is so high that they cannot effectively compete with the supply of cheap prostitutes trafficked from abroad. In this case, trafficking completely crowds out voluntary prostitution. This severs the link between the marriage market and the sex market, so that criminalization—ideally of the john—unambiguously reduces trafficking.

Second, we study the effect of sex tourism in a model extension with two countries, where both start out with laws against prostitution and one decides to abolish them. The country that legalizes prostitution gains a comparative advantage and hence attracts the entire market for commercial sex. Men from the other country, where the sex market disappears, travel to buy sex. Due to this shift in demand, trafficking increases in the country where legalization takes place; importantly, however, trafficking decreases in the other country and may therefore decrease overall. Thus, in the presence of sex tourism, one cannot assess how legalizing or criminalizing prostitution affects trafficking by looking at only domestic changes.

Third, we discuss the effect of (laws on) social norms. Norms against prostitution work like criminal penalties: They first and foremost discourage voluntary prostitution. As voluntary prostitution decreases and because traffickers do not internalize the stigma suffered by their victims, trafficking assumes a larger share of overall prostitution. For the same reason, when norms against prostitution are strong, criminalizing johns is more likely to hit traffickers as opposed to voluntary prostitutes.

Last, we discuss the issue of political will. In our model men always prefer prostitution to be legal because it lowers the price of sex and marriage. Among the women, there can be disagreement. Voluntary prostitutes may but need not be against criminalization. In the absence of voluntary prostitution, however, all women favor criminalization, especially when trafficking abounds. Thus one implication of our model is that prostitution laws are stricter, or more consistently enforced, in countries with higher income levels (which attracts trafficking) and smaller male–female income ratios (which reduces voluntary prostitution).

The key antecedent to our paper is the work of Edlund and Korn (2002) on voluntary prostitution. As in their framework, voluntary movements in and out of prostitution in our model are driven by women who trade off the income that prostitution generates against the benefits of marriage and other types of work. Edlund, Engelberg, and Parsons (2009) establish empirical evidence of a wage premium that is linked to relinquished marriage market opportunities in the U.S. upper-end escort market. In a lower-end prostitution market, Arunachalam and Shah (2008) document a wage premium for sex work relative to other low-skill labor markets, which is explained as compensation for the higher risk exposure in prostitution relative to other low-skill jobs.[4] Our main insight—namely, that a combination of narrow legalization with criminalization of johns is optimal—is independent of whether the opportunity cost of prostitution is mainly safety or relinquished marriage market opportunities. We do not consider the distinction between brothel and street sectors (see Gertler and Shah [2009] for an excellent theoretical and empirical analysis of this issue).

A seminal study on the regulation of markets for illegal goods, such as unlawful sex, is Becker, Murphy, and Grossman (2006). They study the problem of a government that wants to reduce (excess) consumption of a good whose social value is lower than its private value. Government efforts to suppress the supply of the good are imperfect in that production may continue underground at higher cost. They show that, if demand or supply is sufficiently inelastic, such regulation may—while curbing consumption—actually increase the total resources spent on (the production of) the good. Based on this insight, the authors argue that, for example, the social cost of the "war on drugs" may outweigh its social benefit. Akee et al. (2010) build on this insight in a model of cross-border trafficking, in which middlemen sell trafficking victims to domestic or foreign buyers. In their model, anti-trafficking

---

[4]Whether legal or not, prostitution entails considerable risks to health and safety. In the United States, prostitutes suffer a "workplace homicide rate" 51 times higher than that of the next most dangerous occupation, working in a liquor store (Potterat et al. 2004). Further, unprotected sex exposes prostitutes to the risk of HIV and other sexually transmitted diseases, for which it has been shown that prostitutes draw a premium (see Rao et al. [2003] for such evidence from India; Gertler, Shah, and Bertozzi [2005] for evidence from Mexico; and Levitt and Venkatesh [2007] for evidence from the United States.) Using transaction-level data from Ecuador, Arunachalam and Shah (forthcoming) show that the premium is a compensating differential for disease risk.

laws have an ambiguous effect on the incidence of cross-border trafficking depending on the demand elasticities (as in Becker, Murphy, and Grossman 2006) and the distribution of bargaining power between middlemen and potential buyers. Importantly, depending on the same factors, enforcement efforts in source and destination countries can offset or reinforce each other's impact on cross-border trafficking. The central point emanating from Becker, Murphy, and Grossman (2006) is that, given imperfect enforcement and inelastic demand, it may be optimal for the government to refrain from quantity restrictions, that is, to legalize the market.[5] Our paper focuses on another point. Key to our analysis is that there are two types of producers of commercial sex, voluntary prostitutes and traffickers, and that only one mode of production, as opposed to the good per se, is socially undesirable. The quintessence of our results is that indiscriminate "quantity restrictions"—across-the-board legalization or criminalization—affect these two types of producers differently and thus have an ambiguous impact on undesired production; the restrictions can actually *increase* undesired production because the other mode of production is crowded out.[6] The crucial regulatory question is, then, not whether to suppress production, but how to discriminate between two different modes of production.

There are a few papers that empirically examine the relationship between prostitution laws and trafficking. The findings are mixed. Akee et al. (2010) find that prostitution laws are not—or, in some specifications, negatively—associated with the reported incidence of trafficking between pairs of countries. In contrast, Jakobsson and Kotsadam (forthcoming) and Cho, Dreher, and Neumayer (forthcoming) find that proxy measures of trafficking are higher in destination countries where prostitution is legal. This ambiguity is consistent with our theoretical result that a country that legalizes prostitution may experience an increase or decrease in trafficking. More importantly, our analysis offers a testable prediction about the circumstances under which legalization increases (decreases) trafficking: *a country that legalizes prostitution is more likely to experience an increase in trafficking if its female-male income ratio is higher.* This link between prostitution laws, trafficking inflows, and gender wage gaps may reconcile the conflicting findings and it has, to our knowledge, not yet been tested.

Another theoretical result of ours with implications for the interpretation of empirical evidence is that, in the presence of sex tourism, prostitution laws in one country have exter-

---

[5]Becker, Murphy, and Grossman (2006) also show that excise taxes may be more effective than quantity restriction in this case. However, in a recent paper, Desierto and Nye (2012) argues that the opposite result may obtain if corruption by enforcement officials is added to the model, namely, quantity restrictions can then be more effective than excise taxes in suppressing consumption.

[6]Note that these effects rely on buyers and producers responding to law enforcement and price changes, that is, on demand and supply being elastic.

nalities on the flow of trafficking victims to neighboring countries. Larger trafficking flows to a country where prostitution is legal do not necessarily imply that the country's legalization of prostitution increased overall trafficking; it may simply have absorbed demand from other countries. Thus, to examine whether legalization in one country increases or decreases the *global* level of trafficking, it is necessary to measure the impact on trafficking flows not only to the legalizing country but also to its neighbors—that is, to the legalizing country's "catchment area."

2. Legal prostitution

We build on a simplified version of Edlund and Korn's (2002) model of prostitution markets. There is a unit mass of females and of males. Everybody supplies one unit of labor, and there is an exogenous labor market in which men face a wage y and women a wage w.

There is a market for monogamous marriage and one for sex. Men place a value k on marriage because it gives them access to offspring. To marry, a man must pay his wife a price of marriage, p_m. Women derive utility from offspring independently of marital status and hence do not care for marriage per se. On the sex market, men can buy sex, which they value at e per unit. A prostitute can sell up to a unit of sex at price p_s per unit but does not care for sex per se. A woman can be either a wife with a regular job or a prostitute and maximizes her total income.[7] A man spends all his income on sex or marriage or both.[8] The equilibrium in the marriage and sex markets determines the prices p_m and p_s and the number, or fraction, of women who choose to be prostitutes, n.

A1. $e > k$.

This assumption ensures positive prices and interior solutions.

---

[7]An article on Nevada's legal brothels makes it painfully clear that prostitutes are stigmatized in a manner that may make it hard for them to not only marry but even meet a prospective spouse (Ditmore 2009):

> Some counties and towns impose some extraordinary restrictions on commercial sex workers. The net effect of these regulations is to separate sex workers from the local community. Some jurisdictions require brothel prostitutes to leave the county when they are not working, while others take the opposite tack, forbidding them to leave the brothel where they work. Some do not allow the children of the women who work in the brothels to live in the same area.

[8]In Edlund and Korn (2002), a man spends all his income on sex or marriage, or both, and on consumption. For simplicity we dispense with his consumption, whose addition would not alter our main findings. For empirical support of the assumption that (also) married men buy commercial (extra-marital) sex, see, for example, Farley et al. (2011), who analyze a sample of U.S. commercial sex buyers and find about half of all men who patronize prostitutes to be married.

2.1. Voluntary prostitution

Before introducing trafficking, let us examine the equilibrium of this basic model. We look for a competitive equilibrium in which women are indifferent between being a wife and being a prostitute,

$$p_s = p_m + w; \tag{1}$$

men are indifferent between getting married and buying more sex instead,

$$\frac{p_m}{p_s} e = k; \tag{2}$$

and all male income not spent on marriage is spent on sex,

$$(1-n)(y - p_m) + ny = np_s. \tag{3}$$

This system of equations, (1)-(3), can be solved for p_m^*, p_s^*, and n^*. For convenience, we define $\sigma \equiv e/k$, which expresses how much men value commercial sex relative to reproductive sex, or simply, the value of sex over marriage. Note that A1 implies $\sigma > 1$.

Lemma 1. *In the absence of trafficking, $p_m^* = \frac{w}{\sigma - 1}$, $p_s^* = \frac{w}{1 - 1/\sigma}$, and $n^* = \frac{y}{w} - \frac{1}{\sigma - 1}$.*

The higher the price of marriage, the more men value marriage over sex (lower σ). The price of sex must be higher when marriage and a regular job are more attractive because prostitution must then be sufficiently profitable for a woman to enter it. For the same reason, fewer women become prostitutes when the price of marriage or the female wage increase. This is the central insight of Edlund and Korn (2002): The price of commercial sex reflects the opportunity cost of prostitution, that is, the foregone marriage premium. At the same time more women become prostitutes when male income increases since men then buy more sex.[9] Prostitution, in our model, hence increases with wage inequality y/w. Indeed, if the female wage is not too low relative to the male wage, there is no voluntary prostitution. Lemma 1 describes the equilibrium that arises from free choice in the absence of trafficking. Hereafter we refer to this as the *efficient* outcome.

---

[9]Edlund and Korn (2002) show that a rise in male income can decrease prostitution when child quality in marriage increases with investment in the child and hence the income pooled in marriage. We abstract from this aspect since we focus on trafficking, which unambiguously increases with male income. Indeed, as is clear from our results later, if a rise in male income were to reduce voluntary prostitution, it would increase trafficking even more.

2.2. Voluntary prostitution and trafficking

Our innovation is to add to this framework human traffickers who abduct women and force them into prostitution. While the term *trafficking* evokes images of individuals abducted by violent means, the 2000 United Nations Trafficking Protocol defines trafficking more broadly, to also include the recruitment, transportation, transfer, harboring or receipt of persons by means of threat of force, fraud, deception, or the abuse of power. Throughout the paper we may use the term *abduct*; this should, however, be understood in the wider sense of inducing an individual to engage in prostitution against her will. Further, trafficking does not necessarily imply cross-border transportation; in fact, estimates suggest that the majority of trafficking victims in the United States are abducted from within the country.[10] Here we assume that trafficked women are abducted "domestically." We consider cross-border trafficking in Section 4.1.

We assume that a trafficker bears a cost $c(n_t)$ per trafficked woman where n_t denotes the aggregate level of trafficking.[11] We assume that $c(n_t)$ is increasing.[12] A possible justification of this assumption is that more competition in trafficking makes it more difficult for each trafficker to find and procure victims. On the sex market, trafficked, or involuntary, prostitutes sell sex at competitive prices but their revenues are extorted by their traffickers.

We assume free entry into trafficking. So any trafficker that enters the market must make zero profits in equilibrium:

$$p_s = c(n_t). \tag{4}$$

We can replace p_s with $c(n_t)$ in (1)-(3) to get $c(n_t) = \frac{w}{1-1/\sigma}$. If the solution to this equation, $\hat{n}_t$, is smaller than n^*, as defined in Lemma 1, then the level of trafficking is $n_t^* = \hat{n}_t$ and the total level of prostitution is n^*, which is the same as before but now includes both voluntary and involuntary prostitution. But if $\hat{n}_t$ is larger than n^*, then trafficking eliminates voluntary prostitution. In this case the equilibrium is the solution to $n = n_t$, (2), (3), and (4). Solving

---

[10]The most common estimates, oft repeated by major media, suggest that 100,000 to 300,000 children are at risk of being trafficked in the United States every year (Estes and Weiner 2001). The *Village Voice* has contested this estimate, suggesting that the number is as small as 827 children per year (Cizmar, Conklin, and Hinman 2011). The *Village Voice*, however, is run by Village Voice Media, owners of Backpage.com, a website that has received severe criticism for enabling the trafficking of underage girls (see, for example, Kristof 2012a, 2012b).

[11]If trafficking is illegal, the risk of conviction for the trafficker constitutes part of the cost of trafficking, $c(n_t)$. Empirically, this risk is negligible; not only is the risk of arrest small but victims are often too afraid to testify against their perpetrators. For example, despite the fact that trafficking is illegal in the United States, only 130 traffickers were convicted from 2001 to 2005; estimates suggest that this represents a mere 3% of all traffickers (Kara 2009).

[12]This assumption ensures interior solutions but is not crucial. Even with non-decreasing returns, trafficking would be affected by the various policies studied below, with the difference that trafficking would be either profitable on a large scale or not at all.

the first three equations yields expressions for the prices of sex and marriage, respectively,

$$p_s = \frac{y\sigma}{n_t\sigma + (1 - n_t)} \tag{5}$$

and

$$p_m = \frac{y}{n_t\sigma + (1 - n_t)}. \tag{6}$$

Here an increase in trafficking reduces the price of sex because it increases the overall supply of prostitutes. It also decreases the price of marriage because, as sex gets cheaper, marriage becomes less attractive to men; that is, trafficking imposes a negative externality on women in marriage. Finally, substituting (5) into (4) yields

$$\frac{y\sigma}{n_t\sigma + (1 - n_t)} = c(n_t), \tag{7}$$

which yields a unique solution for the level of trafficking, which we denote $\tilde{n}_t$.

Note that $\hat{n}_t$ increases in the female wage w. As women face better labor market conditions, fewer enter voluntary prostitution. This raises the price of sex and thus makes trafficking more attractive. In addition, $\tilde{n}_t$ increases with the male wage y. In this case, where there is no voluntary prostitution, a rise in male income increases the overall demand for sex and so trafficking increases. In sum, there should be more involuntary prostitution, or trafficked prostitutes, where wages are higher and more equal. This is consistent with the fact that the main destinations for trafficked women, or the main markets for involuntary prostitution, are North America and Western Europe.[13]

Proposition 1. *Trafficking crowds out voluntary prostitution, increases total prostitution, and decreases the price of marriage. Trafficking increases with female and male wages.*

The above model describes trafficking in the absence of legal restrictions on prostitution. Trafficking arises because traffickers profit from extorting the income of the women they force to sell sex. Apart from protecting the victims, effective policies against trafficking would eliminate excess prostitution and strengthen women's position in marriage.

3. Regulating prostitution

We analyze the effect of three different sex market regulations: criminalizing the sale of sex, criminalizing the purchase of sex, and a novel regulatory proposal. Following other papers

---

[13]Unlike in the model, trafficking victims often come from abroad; the main origin regions are South and East Asia and Eastern and Central Europe. Section 4.1 introduces cross-border trafficking to the model. The above insight still holds: Trafficking in(to) a country increases in male and female domestic wages.

in this area, we abstract from public implementation costs (such as legislative, judicial, or policing costs) and only focus on the private costs that implemented laws impose on market participants. We discuss implementation costs in Section 5.

3.1. Criminalizing prostitutes

Suppose the government orders the police to arrest prostitutes. Since policing is imperfect, a prostitute faces a probability $q < 1$ of being arrested. We abstract from the public resources spent on such policing and consider only the impact on trafficking and voluntary prostitution. When a prostitute is arrested, her income is confiscated and she bears a criminal penalty κ_s. Traffickers remain undetected and thus go unpunished but they lose the income of prostitutes who are arrested.

When weighing prostitution against marriage, women take a potential arrest into account. So to have both marriage and voluntary prostitution in equilibrium requires

$$(1 - q)p_s - q\kappa_s = p_m + w. \tag{8}$$

For similar reasons, the trafficker's zero-profit condition changes to

$$(1 - q)p_s = c(n_t). \tag{9}$$

In contrast, the men's indifference condition (2) and budget constraint (3) are unaffected.

As before, voluntary prostitution may or may not exist in equilibrium. Let us first consider the case without voluntary prostitution. In this case the price equations (5) and (6) apply. Using (5) in (9) then yields the level of trafficking and hence the total level of prostitution:

$$(1 - q)\frac{y\sigma}{n_t\sigma + (1 - n_t)} = c(n_t). \tag{10}$$

A comparison with (7) reveals that in this case criminalizing prostitutes reduces trafficking. The simple reason is that traffickers are more likely to lose their "investment" to the police, which makes trafficking less lucrative. Moreover, the reduction in trafficking raises the price of sex and hence also the price of marriage.

Turning to the case with voluntary prostitution, we can use (8), (2), and (3) to determine the price of sex

$$p_s = \frac{w + q\kappa_s}{1 - q - 1/\sigma}, \tag{11}$$

the price of marriage

$$p_m = \frac{w + q\kappa_s}{(1 - q)\sigma - 1}, \tag{12}$$

13

and the total level of prostitution

$$n = \frac{y}{w + q\kappa_s}\left(1 - q - \frac{1}{\sigma}\right). \tag{13}$$

We see that a greater criminalization of prostitutes (higher q or κ_s) increases both prices and decreases the total level of prostitution. However, the impact on trafficking is ambiguous. On one hand, there is the same effect as in the first case, which reduces trafficking. On the other hand, there is now the effect that voluntary prostitution is also deterred, which reduces the supply of sex and thus makes trafficking more lucrative. As can be seen by substituting (11) into (9), which yields

$$\frac{w + q\kappa_s}{1 - \frac{1}{\sigma(1-q)}} = c(n_t), \tag{14}$$

the second effect dominates. Thus in this case there is more trafficking when prostitution is criminal than when it is legal. In particular, note that the criminal penalty on prostitutes, κ_s, deters prostitution (see (13)) but fosters trafficking (see (14)). It is therefore optimal to minimize criminal penalties on prostitutes, which would also eliminate the unjust aspect that involuntary prostitutes suffer twice, when trafficked and when arrested.

Finally, note that stricter prosecution of prostitutes can completely eliminate voluntary prostitution, namely, when it renders (11) and (12) negative. However, it cannot completely eliminate trafficking unless enforcement is perfect, since (10) has a positive solution unless $q = 1$. Given demand, trafficking remains profitable since the traffickers do not internalize the criminal penalty.

Proposition 2. *Criminalizing prostitutes decreases total prostitution and increases the price of marriage. It increases trafficking as long as there is voluntary prostitution, but decreases it otherwise. However, it cannot eradicate trafficking.*

In the policy debate on prostitution, opponents of legalization argue that criminalization reduces trafficking. Our analysis suggests that this can but need not be true. It is true when prostitution is predominantly involuntary. However, when this is not the case, criminalizing prostitutes shifts the supply of sex from voluntary prostitution toward trafficking. Contrary to common wisdom, legalization can thus decrease trafficking, provided that a large share of prostitution is voluntary. Put differently, criminalization is more likely to deter trafficking where voluntary prostitution is less likely to emerge, such as in countries where men and women earn similar wages.

3.2. Criminalizing johns

Consider a law that punishes only buyers of sex. Specifically, suppose the police is to arrest johns but spare the prostitutes. Arrests occur after the consummation of sex and a john's probability of being arrested is $q < 1$. We assume that arrested johns bear a criminal penalty commensurate with the amount of sex they have bought. More specifically, an arrested john who has bought x units of sex receives a penalty $x\kappa_b$. This assumption captures the idea that men who buy more sex are caught and penalized more frequently. We deliberately allow the prostitutes to keep their income to isolate the demand-side effects of criminalizing the buyers rather than the sellers.

Men now take a potential arrest into account when entering the market for sex. In effect, they value one unit of sex at $e' = e - q\kappa_b$. If $e' \leq 0$, there is no (demand for) prostitution. Otherwise, in equilibrium, men's demand for sex must satisfy the indifference condition

$$\frac{p_m}{p_s}e' = k, \tag{15}$$

which is identical to (2) except that e' replaces e. The women's indifference condition (1), the men's budget constraint (3), and the traffickers' zero-profit condition (4) are unaffected. If the equilibrium does not involve voluntary prostitution, the prices are given by (5) and (6) and total prostitution is given by (7), except that $\sigma' \equiv e'/k$ replaces σ. We see immediately that stricter criminalization of johns (lower e' and thus lower σ') increases the price of both sex and marriage and reduces prostitution and hence trafficking.

In contrast, when there is voluntary prostitution, total prostitution and the prices of sex and marriage are given by the values in Lemma 1 with $\sigma' \equiv e'/k$ instead of σ. Stricter criminalization of johns again both raises prices and lowers total prostitution. However, in this case the level of trafficking is determined by (4) and the criminalization of johns increases trafficking. As with the criminalization of prostitutes, the effect works through the price mechanism and the decrease in voluntary prostitution. The criminalization of johns reduces σ', that is, the relative appeal of sex versus marriage, and so more men want to be married. To attract more women into the marriage market, the price of marriage increases, which implies that the price of sex must also increase until the marginal woman is indifferent between prostitution and marriage. Thus, the criminalization of johns raises the price of sex by lowering voluntary prostitution, which makes trafficking more lucrative. Once voluntary prostitution fully disappears, the first case applies, in which case stricter criminalization reduces trafficking. Finally, note that the criminalization of johns, as opposed to prostitutes, can in principle eliminate trafficking since demand vanishes for $e' \leq 0$. However, this also eliminates prostitution in general.

15

Proposition 3. *Criminalizing johns decreases total prostitution and increases the price of marriage. It increases trafficking if it deters voluntary prostitutes, but decreases it otherwise. A sufficiently large penalty on johns can eradicate trafficking.*

Criminalizing johns attacks demand, as opposed to supply. A policy targeted at demand may seem to affect traffickers and voluntary prostitutes equally, but this is not true. As men become more reluctant to buy sex, the price of marriage increases, and hence the opportunity cost of voluntary prostitutes. Traffickers do not take this cost into account. Thus the policy again has an ambiguous effect and more likely deters trafficking where there is little voluntary prostitution, such as in countries with a small gender wage gap. But criminalizing johns has two advantages over criminalizing prostitutes: First, it does not penalize trafficking victims. Second, it can in principle eradicate demand and, as a result, supply. However, trafficking persists if, contrary to our assumption, some men—for example, because they are excluded from the marriage market and have a strong urge for sex—cannot be deterred from buying sex, that is, if part of the demand is inelastic (which is, as Becker, Murphy, and Grossman [2006] argue, often the case for "illegal goods"). Finally, note that when the criminalization of johns does eradicate trafficking, it also eliminates voluntary prostitution.

3.3. A "safe harbor" proposal

So far, we have considered legalizing prostitution, criminalizing prostitutes, and criminalizing johns, the last two of which are not mutually exclusive. Our analysis reveals several issues: First, none of these approaches are unequivocally superior, nor does any one seem particularly effective, in curbing trafficking. Second, criminalizing prostitutes penalizes trafficked women, who are victims. Third, any type of criminalization imposes costs on voluntary prostitutes, irrespective of whether it increases or decreases trafficking.

We now analyze an alternative regulatory approach. For the sake of argument, suppose the government runs a hotel. As we discuss in Section 5, it need not necessarily be run by the government so long as it is well monitored. The hotel allows prostitutes to work on its premises provided that they receive a license. Licensed prostitutes can freely work in the hotel, quote their own prices, and keep all their income; that is, the government does not make a profit. For simplicity, we abstract from overhead costs. The key assumption is that the government can run a background check on license applicants to verify that they are not trafficked. This assumption seems realistic. For brevity, we refer to this arrangement as a "state-run brothel."

Introducing only state-run brothels changes little. As long as private prostitution remains legal, the outcome will be the same as under Proposition 1, except that private brothels now

16

compete with state-run brothels that have no specific competitive advantage. In fact, given a level playing field, voluntary prostitutes are indifferent as to where they work. This changes when the sale and purchase of sex outside of state brothels is illegal. As before, assume that, when caught in an illegal sex transaction, the john bears a criminal penalty κ_b while the prostitute bears a criminal penalty κ_s and has her income confiscated. The probability of arrest is q.

Under this regime men choose not only between marriage and (more) sex but also between legal and illegal brothels. They are indifferent between the two kinds of brothels when

$$\frac{e}{p_{s,g}} = \frac{e'}{p_{s,p}}, \tag{16}$$

where $e' \equiv e - q\kappa_B$, as before. Given $e' < e$, non-licensed prostitutes must undercut licensed prostitutes to attract demand; that is, they must set $p_{s,p} < p_{s,g}$. Similarly, women choose not only between marriage and prostitution but also between legal and illegal prostitution. They are indifferent between legality and illegality when

$$(1 - q)p_{s,p} - q\kappa_s = p_{s,g}. \tag{17}$$

However, (17) requires that $p_{s,p} > p_{s,g}$ and therefore contradicts (16). This is true even when there is no criminal penalty for prostitutes, $\kappa_s = 0$, so long as $q > 0$. As a consequence, there is no voluntary entry into illegal prostitution.

The equilibrium is then given by the indifference condition of voluntary prostitutes,

$$p_{s,g} = p_m + w; \tag{18}$$

the men's two indifference conditions,

$$\frac{p_m}{p_{s,g}}e = \frac{p_m}{p_{s,p}}e' = k; \tag{19}$$

the men's budget constraint,

$$(1 - n)(y - p_m) + ny = n_v p_{s,g} + n_t p_{s,p}, \tag{20}$$

where n_v denotes the number of voluntary, and hence licensed, prostitutes; and the trafficker's zero-profit condition,

$$(1 - q)p_{s,p} = c(n_t). \tag{21}$$

This is a system of five independent equations with five unknown variables: the prices p_m,

$p_{s,g}$, and $p_{s,p}$ and the number of voluntary and involuntary prostitutes, n_v and n_t.

Instead of solving this system, we look at the impact of the various policy parameters, q, κ_s, and κ_b. First, note that κ_s appears nowhere. It no longer affects voluntary prostitution because voluntary prostitutes work legally in state-run brothels. Nor does it affect trafficking because the traffickers do not bear this cost. Given that it is immaterial, we can set $\kappa_s = 0$, which eliminates the unjust aspect of penalizing trafficking victims.[14] Second, a higher q reduces trafficking in two ways. It makes it more likely that traffickers will lose the income of their victims (see (21)). In addition, it reduces the demand for, and hence the price of, illegal sex (lower e' and hence $p_{s,p}$ in (19)), which in turn renders trafficking less attractive (see (21)). Third, a sufficiently high κ_b eliminates trafficking altogether. Setting κ_b so high that $e' < 0$ completely deters the demand for illegal sex. However, it does not deter voluntary prostitution. In fact, in that case the system (18)-(21) simply collapses to the system (1)-(3).

Proposition 4. *A system of licensed prostitution combined with severe criminalization of the purchase of unlicensed prostitution eliminates trafficking and restores voluntary prostitution to its efficient level.*

This policy restores the efficient outcome, as derived in Lemma 1. Its logic is strikingly simple: Criminalizing business with unlicensed, or illegal, prostitutes causes voluntary prostitutes to self-select into the state-run brothel. This leaves only involuntary prostitutes in the illegal sector. Now the government can raise the penalties on johns in the illegal sector to eradicate the demand for illegal sex and thus trafficking. For the criminalization to effectively deter trafficking, it is crucial that voluntary prostitutes have the "safe harbor"—otherwise, trafficking may increase due to crowding-out. At the same time, suffocating trafficking in this way restores (the demand for) voluntary prostitution to its efficient level. Note that this policy eradicates trafficking even when demand is inelastic because the demand can migrate to the "safe harbor." This highlights the instrumental role that the criminalization of *johns* outside but not inside the "safe harbor" plays as part of this policy in eradicating trafficking. Indeed, note that simply identifying and criminalizing *only* involuntary prostitutes could not eliminate trafficking (unless enforcement is perfect) because it would not fully divert demand away from traffickers. In other words, the effectiveness of the proposed policy is not merely a matter of being able to distinguish between voluntary and involuntary prostitutes.

---

[14]This also reduces violence toward prostitutes committed by law enforcement officers and encourages trafficking victims to seek assistance and even cooperate with law enforcement, which are aspects not captured by this model but important in practice.

4. Migrants, sex tourists, norms, and political will

The conclusions above may not all hold for small open countries since cross-border supply and demand effects can change the impact of policies. In addition, when the law has an expressive function, legalization of prostitution may make commercial sex more acceptable in the population and thus increase it. We analyze these possibilities below. In addition, we discuss which constituents in our model would like to enact prostitution laws.

4.1. Migrant prostitutes and cross-border trafficking

Some of the effects in the previous analysis depend on the link between the marriage market and the sex market created by women's choice between marriage and prostitution. The link is important, as can be seen from the fact that criminalization has markedly different effects when trafficking completely crowds out voluntary prostitution, in which case this link is severed. This suggests that an elastic inflow of prostitutes, voluntary or involuntary, from abroad can change the impact of policies because it can potentially sever the link between the domestic sex market and the domestic marriage market.

Suppose the previous model describes a small country with open borders. Women from the rest of the world can immigrate to work as prostitutes at cost $c_f = l + p_{m,f}$, which includes relocation expenses, l, and the foregone opportunity of marriage in the origin country, $p_{m,f}$. While such costs can be heterogenous, c_f represents the minimum and the country is so small that, for all intents and purposes, the supply of foreign prostitutes is infinitely elastic at this cost. For simplicity, immigrant prostitutes do not enter the domestic marriage market.[15]

A2. $c_f < p_s^* = \frac{w}{1 - 1/\sigma}$.

This assumption says that the cost of foreign prostitution does not exceed the price of sex in a market with only domestic prostitutes, which is to say that foreign prostitutes can compete with domestic ones. Note, by the way, that for given c_f, A2 is more likely to be satisfied for high w, in which case more domestic women prefer a career other than prostitution. This is to say that countries with higher female wages have fewer domestic prostitutes and experience a larger inflow of prostitutes from countries where women earn less.

Foreign prostitutes will enter the market so long as $p_s > c$. So, in equilibrium, the price of sex must satisfy

$$p_s = c_f. \tag{22}$$

---

[15]Assuming that immigrant women are less valuable on the marriage market or face lower domestic wages yields similar conclusions.

Given that the supply of commercial sex is infinitely elastic at this price, men will spend the minimum on marriage to maximize the consumption of sex. The minimum price of marriage that domestic women demand is given by $p_m = p_s - w$, so

$$p_m = \max\{c_f - w, 0\}. \tag{23}$$

The prices (22) and (23) also determine the men's choice between getting married and buying more sex. Men have a strictly positive demand for marriage if $\frac{p_m}{p_s} e < k$. When $p_m = 0$, this clearly holds. When $p_m = c_f - w > 0$, this inequality becomes

$$c_f < \frac{w}{1 - 1/\sigma}, \tag{24}$$

which, given **A2**, also holds. Thus, all domestic men and women get married in equilibrium; the inflow of cheaper foreign prostitutes fully crowds out domestic prostitution. The equilibrium level of (foreign) prostitution, n_f, is hence given by the budget constraint $y - p_m = p_s n_f$, which after substituting (22) and (23) yields

$$n_f = \min\left\{\frac{y + w}{c_f} - 1, \frac{y}{c_f}\right\}. \tag{25}$$

The inflow of foreign prostitutes rises with both male and female wages. In either case more male income is spent on sex, in the second case because the price of marriage decreases when domestic women earn more. Altogether, this implies that countries with higher wages attract more foreign prostitutes, or, as discussed below, more cross-border trafficking.

It is easy to introduce cross-border trafficking into the above model. Since traffickers only care about relocation costs but not about the women's opportunity costs such as foregone marriage, the cost of trafficking is $c_{f,t} = l < c_f$. Trafficking thus crowds out voluntary foreign prostitutes; that is, $c_{f,t}$ replaces c_f in the above equations and all foreign prostitutes will be trafficked ones.

Importantly, criminalization unambiguously reduces trafficking in this case. The reason is that marriage decisions are now decoupled from the sex market. So neither the criminalization of prostitutes or johns crowds out voluntary prostitution; all prostitution is involuntary. For example, consider criminalizing prostitutes with $\kappa_s = 0$. The traffickers' zero-profit condition is then $(1 - q)p_s = c_{f,t}$, or $p_s = \frac{c_{f,t}}{1-q}$. This affects the price of marriage, $p_m = p_s - w$, and the budget constraint, which becomes

$$y - \max\left\{\frac{c_{f,t}}{1 - q} - w, 0\right\} = \frac{c_{f,t}}{1 - q} n_f. \tag{26}$$

For a fixed n_f, higher q increase the right-hand side but decrease the left-hand side: Not only does criminalization make sex more expensive but it also lowers total spending on sex as the price of marriage rises. As a consequence, fewer prostitutes can be supported in equilibrium; that is, n_f must fall to satisfy the equation.

Nevertheless, the "safe harbor" regulation proposed in Section 3.3 is better than across-the-board criminalization. It is as effective in deterring trafficking but further opens up the possibility of restoring voluntary foreign prostitution. In fact, the government could regulate the inflow and so the level of voluntary prostitution.[16]

4.2. Sex tourism

The previous section focuses on cross-border supply effects by restricting men to domestic markets. This section does the opposite; namely, it focuses on cross-border demand effects by restricting women to domestic markets. Consider two identical countries, A and B, each described by our basic model. The male wage, y, the female wage, w, the value of marriage, k, and the value of sex, e, are the same across the two countries. Women enter only domestic markets. Men marry only domestic women but, crucially, can buy sex domestically or abroad. Traffickers operate internationally and their cost function is $c(n_t)$.

We make a simple comparison. The benchmark setting is that both countries criminalize prostitution to the same degree. The probability of arrest, the penalty on prostitutes, and the penalty on johns are, respectively, q, κ_b, and κ_s in either country. We then study what happens when one country legalizes prostitution.

We assume that there is voluntary prostitution in the benchmark setting. Given that the countries are completely identical, we consider the symmetric equilibrium in which the price of sex is

$$p_{s,A}^* = p_{s,B}^* = \frac{w + q\kappa_s}{1 - q - 1/\sigma'}, \tag{27}$$

the price of marriage is

$$p_{m,A}^* = p_{m,B}^* = \frac{w + q\kappa_s}{1 - q - 1/\sigma'} - w, \tag{28}$$

the number of prostitutes in each country is

$$n_A^* = n_B^* = \frac{y}{w + q\kappa_s}\left(1 - q - 1/\sigma'\right), \tag{29}$$

---

[16]Of course, the domestic women in this model do not welcome migrant prostitution because it reduces the domestic price of marriage, that is, diverts resources away from their households. This points toward political economy aspects of prostitution laws, which we discuss in Section 4.4.

and the number of trafficked women in each country is $n_t^*/2$ where

$$\frac{w + q\kappa_s}{1 - 1/\sigma'(1-q)} = c(n_t^*). \tag{30}$$

These equations are identical to (11)-(14) except that σ' replaces σ.

Suppose country A legalizes prostitution. This makes sex and prostitution more attractive in that country; so we consider an equilibrium in which country A has voluntary prostitution. Its women and men then face indifference conditions (1) and (2) with $p_{s,A} = p_s$ and $p_{m,A} = p_m$. These conditions immediately yield $p_{s,A} = \frac{w}{1-1/\sigma}$, which is smaller than $p_{s,A}^*$ since $\sigma > \sigma'$. This attracts johns from country B, where prostitution is still illegal, and puts downward pressure on the price of sex there. Indeed, there is demand in country B's sex market only if $e/p_{s,A} \leq e'/p_{s,B}$, which yields

$$p_{s,B} \leq \frac{\sigma' w}{\sigma - 1} \tag{31}$$

after substituting for $p_{s,A}$. At the same time, there is supply in country B's sex market only when the domestic women weakly prefer prostitution over marriage,

$$(1 - q)p_{s,B} - q\kappa_s \geq p_{m,B} + w, \tag{32}$$

or else there are no prostitutes, and when the domestic men weakly prefer sex to marriage,

$$\frac{p_{m,B}}{p_{s,B}}e' \geq k, \tag{33}$$

or else the men bid up the price of marriage. Thus the sex market in country B is active only if (31)-(33) hold simultaneously. As it turns out, this is impossible.[17] For women in country B to be willing to sell sex at a price so low that they can compete with country A's sex market, the domestic price of marriage must fall. But before it reaches the level at which the women would enter prostitution, it reaches a level at which the men want to get married.

Thus we focus on an equilibrium in which everyone in country B marries and men from country B travel to country A to buy sex. In equilibrium, the men in country B must prefer marriage to buying more sex in country A,

$$\frac{p_{m,B}}{p_{s,A}}e \leq k, \tag{34}$$

---

[17]For example, (31) and (32) jointly imply $p_{m,B} \leq \frac{\sigma' w}{\sigma-1}(1-q) - w - q\kappa_s$, whereas (32) and (33) jointly imply $p_{m,B} \geq \frac{w+\kappa_s}{(1-q)\sigma'-1}$. These two inequalities can hold simultaneously only if $\frac{w+\kappa_s}{(1-q)\sigma'-1} \leq \frac{\sigma' w}{\sigma-1}(1-q) - w - q\kappa_s$. It is easy to show that the last inequality leads to contradiction for $\kappa_s = 0$ and hence a fortiori for $\kappa_s > 0$.

and the women in country B must prefer marriage to prostitution,

$$(1 - q)p_{s,B} - q\kappa_s \leq p_{m,B} + w. \tag{35}$$

These two conditions can be jointly satisfied.[18] We let men spend the minimum on marriage to maximize their consumption of sex. This means setting $p_{s,B} = \frac{\sigma'w}{\sigma-1}$ (see (31)) and choosing $p_{m,B}$ such that (35) binds. This yields

$$p_{m,B} = \max\left\{(1 - q)\frac{\sigma'w}{\sigma - 1} - q\kappa_s - w, 0\right\}. \tag{36}$$

For any lower price of marriage, a woman could sell sex and be better off than in wedlock.

So, in our model, the entire market for sex moves to country A where prostitution is legal, and men from country B become sex tourists. Traffickers also send their victims to country A, where the price of sex is higher. The price of sex falls, as does the price of marriage in both countries. The total level of prostitution, $n = n_A$, is given by $(y - np_{m,A}) + (y - p_{m,B}) = np_{s,A}$, and can be higher than the benchmark setting. The total level of trafficking is given by

$$\frac{w}{1 - 1/\sigma} = c(n_t). \tag{37}$$

A comparison with (30) shows that total trafficking decreases after legalization; that is, the solution to (37) is smaller than n_t^*.[19] However, it need not be smaller than $n_t^*/2$.[20] In other words, legalization may raise trafficking in country A even as it reduces trafficking across both countries. Thus how a country's legalization or criminalization of prostitution impacts trafficking cannot be inferred from looking only at changes in that country. Legalization may lead to a rise in trafficking there but to a larger drop elsewhere. Analogously, criminalization may lead to a drop in trafficking there but to a larger rise elsewhere due to sex tourism. Hence the model predicts that a country that legalizes prostitution, such as Spain or the Netherlands, should experience a rise in sex tourism and trafficking but its neighboring countries should also experience a decline in prostitution and trafficking.

Suggestive evidence on cross-border effects comes from Sweden, which passed a law that criminalizes johns in 1999. Interestingly, the number of foreign, and presumably involuntary, prostitutes rose subsequently in the neighboring countries (The Swedish Government 2010,

---

[18]To see this, rewrite (34) as $p_{m,B} \leq \frac{w}{\sigma-1}$ after substituting for $p_{s,A}$, and (35) as $p_{m,B} \geq (1-q)\frac{\sigma'w}{\sigma-1} - w - q\kappa_s$. These inequalities can hold simultaneously only if $(1 - q)\frac{\sigma'w}{\sigma-1} - w - q\kappa_s \leq \frac{w}{\sigma-1}$. It is easy to show that the last inequality holds for $\kappa_s = 0$ and hence a fortiori for $\kappa_s > 0$.

[19]This result obtains only because we assume that there is voluntary prostitution. If voluntary prostitution is crowded out to begin with, legalization always increases trafficking (see Section 3).

[20]That would depend on the parameters and the shape of $c(\cdot)$.

p. 7):

> We have noted that the prevalence of street prostitution was about the same in the three capital cities of Norway, Denmark and Sweden before the ban on the purchase of sexual services was introduced here, but the number of women in street prostitution in both Norway and Denmark subsequently increased dramatically. In 2008, the number of people in street prostitution in both Norway and Denmark was estimated to be three times higher than in Sweden.

Further, the report notes a significant increase in the number of foreign women in street prostitution reported from both Denmark and Norway, which suggests that the increase in Sweden's neighboring countries may have been due to trafficked women.

The government report does not explicitly discuss whether the Swedish sex market has simply moved abroad. However, the following four facts facts indicate that this question deserves more attention: First, the report reviews two surveys of Swedish men, both of which showed "that it was more common to buy sex abroad than in Sweden" (p. 32). Second, it also reports that shortly after the criminalization of johns in Sweden, the number of trafficked women from Nigeria present in Norway, which borders Sweden to the East, increased dramatically and that, according to a Norwegian organization, the increase was "due, in part, to changes in the prostitution markets in European countries, for example, the criminalization of the purchase of sexual services in Sweden in 1999" (p. 20). Third, the report states that Gothenburg, a Swedish city close to Norway, experienced a dramatic increase in trafficked prostitutes from Nigeria after 2009, when sex purchases were criminalized in Norway as well (p. 20). Finally, the report notes that the total number of foreign prostitutes in all three Scandinavian countries—Denmark, Norway, and Sweden—has increased since the Swedish law was passed.

4.3. Laws and norms

Law affects behavior not only through enforcement but also through an expressive role: It can affect societal norms (see, for example, Benabou and Tirole 2011). In our context, for example, legalizing prostitution may make both the purchase and sale of commercial sex socially more acceptable (Kotsadam and Jakobsson 2011). The simplest way of incorporating this aspect into the model is to assume that legalization (criminalization) increases (decreases) the intrinsic value that women derive from prostitution and men derive from buying sex. To isolate this aspect we also abstract from actual enforcement and assume that criminalization is merely nominal; that is, $q = 0$.

So, suppose a man's utility from buying a unit of sex is e when prostitution is legal and $e - g_b$ otherwise. Similarly, a woman's utility from selling a unit of sex is p_s when prostitution is legal and $p_s - g_s$ otherwise. The disutilities g_b and g_s can be interpreted as guilt or stigma. It is immediately apparent that in our model g_b and g_s have the same impact as expected criminal penalties. We can therefore apply the results from Section : Legalization increases overall prostitution, but it need not increase trafficking—on the contrary, it can reduce it. Even the intuition is virtually the same. Stigma associated with prostitution deters voluntary prostitutes but not traffickers, who do not care about the stigma borne by their victims. Norms that reduce voluntary prostitution can therefore create more room for trafficking. Absent voluntary prostitution, stigmatizing johns decreases trafficking, while stigmatizing prostitutes does not. By the same token, in countries where norms against prostitution are strong, and hence voluntary prostitution is low, criminalization of johns is likely to deter trafficking.

4.4. Political will

The last issue we discuss is the political will to legalize or criminalize prostitution. Our model predicts that, despite its low repute, prostitution can be a welcome institution. To begin with, irrespective of marital status, the men always prefer prostitution to be legal. Legalization reduces the price of sex and hence the price of marriage as well. The men, of course, benefit from both marriage and sex (or reproductive and non-reproductive sex) being cheaper.

So in our model, if anyone, it is women who want to criminalize prostitution. But not even that is necessarily the case. Voluntary prostitutes, if they exist, do not necessarily gain from abolishing the sex market. This is, for example, the case when former prostitutes find it difficult to marry or face an income in the regular job market that is much lower than a prostitute's income. By means of illustration, suppose the female wage decreases in the number of women in regular jobs. For the sake of argument, suppose it is $w = \gamma_w n$. A voluntary prostitute's income, p_s, is then given by the solution to (1)-(3) except that $\gamma_w n$ replaces w in (1). Solving this system of equations yields two possible equilibrium outcomes (one with few prostitutes and one with many), with a prostitute's income being

$$p_s = \frac{\sigma \gamma_w}{\sigma - 1} \left(\frac{1}{2(\sigma - 1)} \pm \sqrt{\frac{1}{4(\sigma - 1)^2} - \frac{y}{\gamma_w}} \right), \tag{38}$$

provided that the root is positive, which is true for $\gamma_w/y \leq 4(\sigma - 1)^2$.

By comparison, if the government were to criminalize johns so severely that all and

any prostitution is deterred, all women, then married, would simply earn y. Voluntary prostitutes prefer prostitution to remain legal when (38) is larger than y. This is, for example, always true in the equilibrium with few prostitutes, that is, for the larger of the two possible equilibrium wages in (38).[21]

By contrast, suppose there are no voluntary prostitutes, which is more likely the case when lucrative jobs for women are ample and the gender wage gap is small (that is, when w is largely independent of n and y/w is small). In this case, women are unanimously in favor of criminalizing prostitution. Not only would the criminalization lower the probability of their being abducted by traffickers, but it would also increase the price of marriage by decreasing men's consumption of commercial sex (from involuntary prostitutes).

Thus our model suggests that the political will to criminalize prostitution, especially johns, should be stronger in countries with smaller gender wage gaps (which reduces voluntary prostitution) and higher income levels (which promotes trafficking). Table 3 shows some simple statistics that are broadly consistent with this prediction: Within the Organization of Economic Cooperation and Development (OECD), prostitution laws tend to be stricter in countries with smaller male-female income ratios.[22]

Table 3

South Korea offers an interesting anecdote. In 2004, the South Korean government adopted the Swedish model of criminalizing only johns, pimps, and brothel owners and increased the criminal penalties. When the law was enacted, South Korean sex workers took to the streets (Salmon 2004):

> But enforcement of the law has also sparked angry showdowns between women in favor of the law and those against it. When the crackdown began, fistfights were reported between prostitutes and women activists . . .
>
> Some in the industry defend the trade. "I think wives' associations are behind the crackdown," said Park Song Bok, 49, who manages a bar in the red-light

---

[21]Suppose $\gamma_w/y \leq 4(\sigma-1)^2$, that is, the root is positive. Setting the root to zero, we get a lower bound on the larger of the two solutions in (38): $\frac{\sigma\gamma_w}{2(\sigma-1)^2}$. It is simple to show that this is larger than y, given that the root is positive.

[22]The female-male income ratios in Table 2 are from the OECD Gender, Institutions and Development Database 2009. We have coded the prostitution law as 2 where prostitution is illegal, 1 where it is partly legal, and 0 where it is legal and regulated. Our coding is based on the 2008 Country Report on Human Rights Practices (United States Department of State 2009). Based on information provided by ProCon (http://prostitution.procon.org/view.resource.php?resourceID=000772), we adjust the codes to 0 for countries that hardly enforce their prostitution laws, which includes Slovenia, the Czech Republic, Spain, Belgium, Italy, Japan, and Chile. The estimates of the percentages of men who have paid for sex are also from Pro-Con (http://prostitution.procon.org/view.resource.php?resourceID=004119). The estimates of prostitution revenue are from Havocscope (http://www.havocscope.com/prostitution/ranking).

district of Itaewon and has been in the industry for more than 20 years. "But what about single guys?" she said. "And married men always hide some money to pay for it."

Sex worker rallies against the ban on prostitution have recurred in South Korea (for example, AP News 2011). Interestingly, unlike the other countries that adopted the Swedish model, South Korea has a very high male–female income ratio. The others—Sweden, Norway, and Iceland—actually have the lowest male–female income ratios in the world (along with Denmark). There have been no public sex worker demonstrations there.

5. Discussion

Regulatory approaches in practice

How do the standard regulatory approaches fare in practice? In Spain, where prostitution is essentially legal, sex trafficking is rampant (Daley, 2012). The same is true for Belgium, Israel, and Italy, all of which allow prostitution (though they prohibit pimping). Thailand and (most of) the United States, where prostitution is illegal, are top destinations for sex trafficking victims; the same is true for Japan where commercial coital sex is illegal (United Nations Office on Drugs and Crime 2006). The Netherlands, Turkey, and (some counties in) Nevada have regulated brothels. The Netherlands and Turkey are top trafficking destinations (United Nations Office on Drugs and Crime 2006), and Las Vegas is among the 13 U.S. cities with the highest levels of child prostitution according to the Federal Bureau of Investigation (2009).

The Swedish model criminalizes only johns. The Swedish government's own evaluation concludes that "prostitution as a whole has at least not increased" since the law passed in 1999 (The Swedish Government 2010, p. 28). The report finds that the law likely reduced street prostitution. Whether total prostitution decreased is less clear, as "marketing via the Internet has completely overshadowed all other methods" (p. 20) and "Internet prostitution has increased in Sweden, Denmark and Norway" (p. 8). Furthermore, the report cannot quantify the law's precise impact on sex trafficking (p. 29):

> The latest report from the Swedish Police states that it is difficult to estimate how many people may have been victims of human trafficking in Sweden in 2007 and 2008. Thus, it has not been possible for the police to identify or even locate all girls and women whose names have been heard in wiretaps or who have been observed during police surveillance.

27

But it notes that "the number of foreign women in street prostitution has increased" (p. 8) and that sex trafficking remains "a widespread crime taking place virtually throughout the country" (p. 29).[23] The prostitutes, between the ages of 13 and 36, come mainly from Estonia, Russia, Rumania, and Poland. Other origin countries include Albania, Bulgaria, Nigeria, Latvia, Thailand, the Czech Republic, and the Ukraine (The Swedish Police 2009, p. 6). In addition, part of Sweden's sex market may have moved to neighboring countries where the number of foreign, presumably involuntary prostitutes has risen dramatically following the Swedish law (see the discussion at the end of Section).

The approaches taken in the Netherlands, Turkey, and Nevada have, in light of our proposal, two main shortcomings: the regulation is neither well-enforced nor coupled with severe prosecution of johns outside of these brothels.[24] The result is an illegal sector where trafficking flourishes, and possibly, a legal sector where even voluntary prostitutes are mistreated. This illustrates the importance of both strict regulation in the legal sector and severe criminalization of johns in the illegal sector. In Sweden, some demand for commercial sex seems to have migrated to illegal and foreign markets that are being supplied by traffickers. There are two ways to reduce this demand. Demand on the domestic illegal market can be reduced through stricter prosecution and punishments for johns. But this does not solve the issue that demand shifts to other countries, and spurs trafficking there. A domestic "safe harbor" would absorb this demand and hence take it away from traffickers both at home and in the other countries.

Whom to criminalize: The prostitute or the john?

If we must choose between across-the-board criminalization of prostitutes or of johns, which should we choose? Our analysis offers a clear answer: Criminalizing the john is superior to criminalizing the prostitute. This is remarkable in light of the fact that only four countries—Sweden, Norway, Iceland, and South Korea—currently penalize only the john. Everything that can be accomplished by criminalizing the prostitute can also be accomplished by criminalizing the john. Further, criminalizing the prostitute entails the unjust aspect of imposing penalties on trafficked prostitutes, which also discourages them from seeking help, and the

---

[23]That said, interviews with police officers suggests that traffickers target Sweden less than its neighboring countries because of its law: "Although it is difficult to assess the exact scope of human trafficking for sexual purposes in Sweden, some data indicate that the scope has been affected by the ban against the purchase of sexual services. Police in the field as well as social workers working with these issues state that criminal groups that sell women for sexual purposes view Sweden as a poor market" (p. 29).

[24]In Nevada, underage girls have been illegally employed in legal brothels (Las Vegas Sun 1998). Further, severe criticism of the pressures and restrictions imposed by legal brothel owners and pimps on employees call into question the safety of (even legal) prostitutes (Ditmore 2009). In the Netherlands, illegal brothels operate parallel to legal ones, and trafficking is common (Simons 2008). In Turkey, illegal brothels operate parallel to government run ones and often employ trafficking victims (Smith 2005).

criminal penalty is borne only by (trafficked) prostitutes, not by traffickers.[25] Finally, while sufficiently severe penalties on johns can eliminate trafficking altogether, by eliminating demand for commercial sex, penalties on prostitutes alone can never eliminate trafficking; as long as there is demand for commercial sex, traffickers will supply sex slaves.

Are there really any voluntary prostitutes?

In our framework involuntary prostitutes are distinguished from voluntary ones in that they are induced—by violence, deception, abuse of power, and the like—to engage in prostitution; they do not choose to pursue such work for their own economic gain. It is worth emphasizing that the group of involuntary prostitutes includes all those compelled to supply commercial sex through a third party who benefits from this trade—even if his means of appeasement is limited to *threats* of force, as opposed to actual force. Further, even though the word *trafficking* tends to evoke images of individuals transported across national borders, trafficking victims are often sourced domestically, for example, by gaining and abusing power over runaway children (Estes 2001).

Voluntary prostitutes in this framework, on the other hand, make their *own active economic choice* to pursue sex work in lieu of other options. Throughout the analysis, we have used as our benchmark the outcome that arises on the market for commercial sex *when no traffickers are present.* This benchmark outcome involves no involuntary prostitution, but so long as some women voluntarily enter the market for commercial sex for their own economic gain, this outcome involves a strictly positive level of voluntary prostitution. As seen, the exact level of voluntary prostitution in this benchmark outcome varies depending on the characteristics of the labor and marriage markets; in particular, it decreases with the gender wage gap and with the economic rewards from marriage. Yet the benchmark outcome typically involves some non-zero level of voluntary prostitution.

An entirely different question is whether women who become prostitutes without being forced by a third party, such as a trafficker or pimp, and who use sex work as a source of income, *de facto* exercise choice. Evidence suggests that many sex workers who nominally choose the occupation are drawn from vulnerable groups in society; portray a history of physical or sexual abuse, often during childhood (Farley and Barkan 1998); claim that they want to leave prostitution but cannot (Farley et al. 2003); and have a heightened prevalence of drug problems and mental diseases such as anxiety, depression and post-traumatic stress disorder relative to non-prostitutes (Burnette et al. 2008; Rössler et al. 2010). These facts

---

[25]If for some reason prostitution must be criminalized, then the probability of arrest should be high and the criminal penalty low—this maximizes the probability that the trafficker's income stream is eliminated but minimizes the cost borne by the involuntary prostitute.

suggest that the decision to engage in prostitution may reflect a lack of choice rather than an actual choice.

The Swedish regulatory model, which criminalizes johns but not prostitutes, was indeed introduced under the assumption that all commercial sex is forced and represents an instance of exploitation of, and violence against, women.[26] If all commercial sex is indeed repressive, then *truly* voluntary prostitution does not exist; as a consequence, the outcome that the desired regulation should induce involves *no prostitution at all.* In that case, the Swedish model—where the john is penalized; the prostitute is not and, if anything, receives assistance – is optimal. With strong enough penalties on the john, this approach would eradicate both trafficking and "seemingly voluntary prostitution."

On the other side of this debate are prostitutes who themselves claim that they choose their profession and are content with it—often promoting the terms *sex worker* or *working woman* (Kurtz et al. 2004, p. 359)—and who argue that rhetoric that victimizes women reflects hypocrisy about sex and about women's sexual autonomy. Evidence supporting the existence of truly voluntary prostitution tends to come from studies of the "upscale" escort or indoor prostitution markets, at least when it comes to developing countries (for example, Bryant and Palmer 1975; Chapkis 1997; Farley and Davis 1978; Lever and Dolnick 2000; Woodward et al. 2004; Brents and Hausbeck 2005). This is not surprising in light of the fact that indoor prostitution is safer and better paid, with salaries for escorts reaching as high as $10,000 per hour in the United States (Venkatesh 2008) and street prostitutes, by comparison, earning only $25 to $30 per hour in Chicago (Levitt and Venkatesh 2007).[27] That said, even in the study showing an association between prostitution and mental disease among prostitutes working in streets, 40% reported being content with their jobs (Rössler et al. 2010).

From developing countries, Robinson and Yeh (2011) present evidence that women increase the supply of risky and better compensated sex in response to unexpected health shocks. Regulating the supply of sex on the intensive margin thus serves as a means to smooth consumption. This is consistent with a theory of voluntary provision of sex labor in exchange for money, but it also suggests that the women are unable to cope with risk through other consumption smoothing mechanisms. Robinson and Yeh (2012) further show that sex workers develop long-term relationships with clients, who partly insure them against negative income shocks.

---

[26]In the words of Thomas Bodström, the former Swedish minister of justice, "as long as men think they are entitled to buy and use women's and girls' bodies, human trafficking for sexual purposes will continue" (quoted in Lagon [2009]).

[27]In a highly publicized case of a high-level escort market transaction, former New York governor Eliot Spitzer paid Ashlee Dupree $4,300 for one evening.

Our analysis suggests that the exact level of voluntary prostitution in the free market outcome varies between countries. It suggests, in particular, that voluntary prostitution decreases with the gender wage gap. Thus, according to our analysis, the Swedish model may indeed be suitable for Sweden, which has the world's smallest male–female income disparity (OECD 2009). In that case, even if Sweden were to introduce regulated brothels, the number of eligible applicants would be essentially zero.

In contexts where not all prostitution is forced, however, the Swedish model would undermine the possibility of consenting adults engaging in mutually beneficial trade. In such contexts, the regulation proposed in Section 3.3, with regulated prostitution and severe punishments on johns who procure sex elsewhere, is the more suitable approach. This regulation also lets non-trafficked prostitutes operate in an environment with extensive monitoring, of their identities as well as of their wellbeing, which simplifies reaching out to prostitutes who need social assistance.

Need the government run the brothels?

In the model we use, for the sake of argument, a state-run brothel to illustrate the main idea behind our proposal. This can but need not be taken literally. The key is to have legal brothels that are intensely regulated and monitored. For example, the government could require both prostitutes and brothels to be licensed: prostitutes to make sure that they enter the profession voluntarily and meet, among other things, health, age, and residency requirements, and brothels to make sure that they do not employ unlicensed prostitutes. With advanced technology, such as biometric identification, it is possible for regulators to ensure a proper licensing procedure for prostitutes, as well as to verify whether a brothel has followed a proper hiring procedure. Thus our point is that legal brothels must be strictly regulated, not that they must be run by the state.

That being said, the requirements that need to be imposed on such a system are many. First, the process of granting licenses to sell sex needs to be rigorous enough to screen out any woman who is underage or trafficked. This can potentially be accomplished by demanding voluntary prostitutes to obtain their licenses, in person, at the police station or a designated office and undergo a background check as rigorous as that required for a new passport. Second, regulation must be strong enough to make sure that each licensed brothel hires only licensed prostitutes. Measures to ensure this may include requiring each licensed brothel to register the licenses of, and perform a biometric check on, each active prostitute on any given evening, ascertaining adherence by conducting unannounced monitoring visits and withdrawing brothel licenses and enacting criminal punishments for any violations.

Nevada's regulated brothels display the difficulty inherent in creating a system of licensed

brothels that only employ voluntary prostitutes. Underage girls have obtained jobs in legal brothels, often with the assistance of pimps, who in some cases have been convicted (Las Vegas Sun 1998; Vogel 1998). Further, critics have severely critisized the pressures and restrictions imposed by brothel owners and pimps on employees (Farley 2007; Ditmore 2009).

Even more so, Nevada's system displays that having regulating brothels does not obviate the need for strong law enforcement against illegal prostitution. Even though prostitution outside licensed brothels is a misdemeanor in Nevada, escort services euphemistically offering sexual services as "entertainment" or "companionship" occupy about 140 pages of the Las Vegas Yellow Pages. In 2009 the Federal Bureau of Investigation identified Las Vegas—a city where no legal brothels exist—as one of 14 U.S. cities with high rates of child prostitution (Whaley 2010). This underscores one of the main messages of our analysis, namely, that it is crucial not only to introduce and monitor legal brothels but also to increase law enforcement and criminal penalties on *johns* who buy sex *elsewhere*. This is necessary, first, for voluntary prostitutes to self-select into legal brothels and, second, to eradicate the demand for commercial sex outside of regulated brothels. Together these effects deter the purchase of sex through channels where the identity and voluntary participation of prostitutes cannot be guaranteed—and thus erode business opportunities for pimps and traffickers.

Who should manage a state-run brothel?

If a country were to decide on state-run brothels, the question then arises as to who should manage the brothel. The answer is not obvious because in many countries police officers do not properly enforce prostitution laws but use them as a threat to extort bribes from pimps or even free sex from prostitutes (for example, Levitt and Venkatesh 2007). Similar issues could arise in state-run brothels. A natural way to address this issue is to let social workers, ideally female ones, rather than male police officers manage state-run brothels. Male officers could still be present for security purposes but final authority would rest with others. In addition, there should be a legal instance where prostitutes can report mistreatment (as with labor councils that settle disputes between management and employees). This not only minimizes the risk of extortion by brothel managers but also encourages prostitutes to come forward with complaints about abuse, precisely what they fear doing in a system where prostitution is illegal.

How to punish johns who buy illegal sex

Our analysis shows that severe punishments on johns who buy sex outside of legal brothels should be an integral part of any policy to combat trafficking. One concern may be that this

is very costly to implement or overstrains penitentiary systems. However, surveys indicate that the most effective deterrent for johns may be a rather cheap one: While roughly 80% of all respondents in a study of sex buyers and non-sex buyers in the United States consider jail time an effective deterrent, both groups state that being placed on a registry of sex offenders and public exposure—such as being publicized in a newspaper, online, or on a billboard—would be the most effective deterrent (Farley et al. 2011). One possibility is therefore to combine financial penalties, a public registry of johns who buy illegal sex, and public exposure of recent offenders to deter johns in a cheap but effective way and to impose prison sentences on repeat offenders. By contrast, in legal brothels the anonymity of johns should be safeguarded (unless, of course, the prostitute is abused); this reduces the relative appeal of illegal sex.

Compared to prison and shaming, both sex buyers and non-sex buyers state that they consider educational programs to be the least effective deterrent (Farley et al. 2011). Such education programs, often called "john schools," are underway in, for example, Illinois (Davis and Hunt 2012). While the effectiveness of such programs alone in deterring the purchase of illegal sex is debated (Farley et al. 2011; Davis and Hunt 2012), educational campaigns certainly cannot harm as a complement to other methods. When a government criminalizes sex outside of regulated legal brothels, it or the media should educate the public on the cruelty of trafficking and the fact that, given the government's regulatory approach, prostitutes who work in the illegal sector are presumably trafficked. This would create awareness and, hopefully, a strong norm against buying illegal sex.

Finally, it should be pointed out that the severity of the criminal penalties imposed on johns who purchase illegal sex should depend on the supply of legal sex. If the supply of legal sex is relatively elastic, less enforcement is needed, since most men would go to the legal sector. However, if the supply of legal sex is low and hence the prices are high, the illegal sector becomes more attractive since traffickers can force their prostitutes to work at lower prices; as a result, stricter enforcement and harsher punishments are needed.

How expensive is the "safe harbor" policy?

Implementing the policy proposed in this paper is costly because it requires (i) the licensing of legal prostitutes, (ii) verification of licenses, and (iii) the prosecution of johns who purchase illegal sex. Proper licensing procedures would require personal background checks, to ensure that the applicant is not being coerced into sex work, and opportunities for any victim sent to apply to covertly share information. Scanner or biometric technology (via smart phones) can serve to allow johns to verify a prostitute's license. The prosecution of johns in the illegal sector would require undercover agents who pose as illegal prostitutes—these may be

(female) police officers or cooperating (former) legal prostitutes—and criminal penalties that are effective deterrents—such as the shaming penalties mentioned further above.

The question is whether this policy, while being the most effective, is much costlier than alternative policies to combat trafficking, notably outright criminalization of prostitution or prosecution of trafficking organizations. The policing costs of fully enforcing criminalization against voluntary and involuntary prostitutes are likely higher than the costs of licensing voluntary prostitutes who actively seek licenses and prosecuting illegal johns as described above. Moreover, outright criminalization is often ineffective because it exposes prostitutes to violence and corruption by police offers who instead of enforcing the laws extort free sex and share in the traffickers' profits. Effective criminalization would also have to bear the cost of preventing such corruption. The "safe harbor" policy does not feature this problem because it does not criminalize prostitutes. In fact, as mentioned above, it may actually invite the cooperation of voluntary prostitutes in combating illegal transactions.

Similarly, the policing efforts to combat trafficking organizations are likely to be high as well. First of all, traffickers are difficult to catch and prosecute, primarily because the victims are reluctant to speak out against them. Therefore, to be effective, this strategy must be combined with extensive witness protection programs. Second, trafficking rings often operate internationally so that effective strategies require cooperation between law enforcement agencies of different countries. Third, dismantling professional criminal organizations may consume more resources than deterring civilian johns, especially since arresting individual traffickers only puts a small dent in trafficking activity due to a ready inflow of new entrants. Fifth, the criminal penalties needed to deter traffickers may be more expensive to administer than those that suffice to deter johns.

6. Conclusion

Our theoretical analysis of how prostitution laws affect voluntary prostitution and trafficking yields several clear conclusions. First, the optimal policy is to combine regulated prostitution with severe criminal penalties on johns who buy sex from unregulated sources. This policy is the most effective against trafficking precisely because it creates a "safe harbor" for voluntary sex work and thereby drains the demand for trafficking. Second, if the objective is to abolish prostitution—be it voluntary or involuntary—completely, the optimal policy is to enforce severe criminal penalties on johns in general. In the absence of either voluntary or involuntary prostitution, the two policies are equivalent. Finally, criminalizing johns is strictly superior to criminalizing prostitutes. The former can always deter as much voluntary prostitution as the latter, but it is more effective in reducing trafficking and comes without the unjust side

effect of penalizing involuntary prostitutes.

A key prediction of our model is that the female-male income ratio is a principal determinant of the structure of the market for commercial sex, the impact of prostitution laws, and therefore the political support for such laws. A higher female-male income ratio lowers voluntary prostitution and thereby raises the share of prostitutes that is trafficked. Since there are fewer voluntary prostitutes, criminalizing prostitution finds more support (among women) and, by the same token, is more likely to decrease trafficking. Conversely, when the female-male income ratio is low, voluntary prostitution is more prevalent and political support against prostitution less pronounced. Moreover, by primarily crowding out voluntary prostitutes, criminalizing prostitution can increase the volume of trafficking. To the best of our knowledge, these predictions have not yet been tested.

References

[1] Akee, Randall, Arjun S. Bedi, Arnab K. Basu, and Nancy H. Chau. 2010. "Transnational Trafficking, Law Enforcement and Victim Protection: A Middleman's Perspective," IZA Discussion Paper No. 6226.

[2] *AP News.* 2011. "South Korean Sex Workers Rally to Protest Stricter Laws," September 22.

[3] Arunachalam, Raj and Manisha Shah. 2008. "Prostitutes and Brides?," *American Economic Review: Papers and Proceedings* 98:516–522.

[4] Arunachalam, Raj and Manisha Shah. Forthcoming. "Compensated for Life: Sex Work and Disease Risk," *Journal of Human Resources.*

[5] Austin, Ian. 2010. "Canada: Brothel Ban Illegal, Court Says," *New York Times*, March 27.

[6] Becker, Gary, Kevin Murphy, and Michael Grossman. 2006. "The Market for Illegal Goods: The Case of Drugs," *Journal of Political Economy* 114:38–60.

[7] Benabou, Roland, and Jean Tirole. 2011. "Laws and Norms," NBER Working Paper No. 17579.

[8] Brents, Barbara, and Kathryn Hausbeck. 2005. "Violence and Legalized Brothel Prostitution in Nevada," *Journal of Interpersonal Violence* 20:270–295.

[9] Bryant, Clifton, and Eddie Palmer. 1975. "Massage Parlors and "Hand Whores" *Journal of Sex Research* 11:227–241.

[10] Burnette, Mandy L., Emma Lucas, Mark Ilgen, Susan M. Frayne, Julia Mayo, and Julie C. Weitlauf. 2008. "Prevalence and Health Correlates of Prostitution among Patients Entering Treatment for Substance Use Disorders," *Archives of General Psychiatry* 65:337–344.

[11] Chapkis, Wendy. 1997. *Live Sex Acts: Women Performing Erotic Labor.* New York, NY: Routledge.

[12] Cho, Seo-Young, Axel Dreher, and Eric Neumayer. Forthcoming. "Does Legalized Prostitution Increase Human Trafficking?" *World Development.*

[13] Cizmar, Martin, Ellis Conklin, and Kristen Hinman. 2011. "Real Men Get Their Facts Straight," *Village Voice News*, June 29.

[14] Daley, Suzanne. 2012. "In Spain, Women Enslaved by a Boom in Brothel Tourism," *New York Times*, April 6.

[15] Davis, Ed, and Swanee Hunt. 2012. "Buying Sex? It Will Cost You," *Boston Globe*, February 21.

[16] Desierto, Desiree and John V. Nye. 2012. "Two Wrongs Make a Right: The Market for Illegal Goods in the Presence of Corruption." George Mason University Working Paper in Economics No. 11-01.

[17] Ditmore, Melissa. 2009. "Sex and Taxes," *The Guardian*, 16 April.

[18] Edlund, Lena, Joseph Engelberg, and Christopher A. Parsons. 2009. "The Wages of Sin," Columbia University Discussion Paper No. 0809-16.

[19] Edlund, Lena and Evelyn Korn. 2002. "A Theory of Prostitution," *Journal of Political Economy*, 110:181–214.

[20] Estes, Richard J., and Neil A. Weiner. 2001. "The Commercial Sexual Exploitation of Children in the U.S., Canada and Mexico," University of Pennsylvania.

[21] Farley, Frank, and Sandy Davis. 1978. "Masseuses, Men, and Massage Parlors," *Journal of Sex and Marital Therapy* 4:219–225.

[22] Farley, Melissa. 2007. *Prostitution and Trafficking in Nevada: Making the Connections.* San Francisco, CA: Prostitution Research & Education.

[23] Farley, Melissa, and Howard Barkan. 1998. "Prostitution, Violence against Women, and Posttraumatic Stress Disorder," *Women & Health* 27:37–49.

[24] Farley, Melissa, Ann Cotton, Jaqueline Lynne, Sybille Zumbeck, Frida Spirvak, Maria E. Reyes, Dinorah Alvarez, and Ufak Sezgin. 2003. "Prostitution and Trafficking in Nine Countries: An Update on Violence and Posttraumatic Stress Disorder," *Journal of Trauma Practice* 2:33–74.

[25] Farley, Melissa, Emily Schuckman, Jacqueline M. Golding, Kristen Houser, Laura Jarrett, Peter Qualliotine, and Michele Decker. 2011. *Comparing Sex Buyers with Men Who Don't Buy Sex: "You Can Have a Good Time with the Servitude" vs. "You're Supporting a System of Degradation."* San Francisco, CA: Prostitution Research & Education.

[26] Federal Bureau of Investigation. 2009. "Chapter 4: Non-Cyber Sexual Exploitation of Children," in *The Federal Bureau of Investigation's Efforts to Combat Crimes Against Children—Audit Report 09-08*, Office of the Inspector General. (Retrieved on May 15, 2012, at http://www.justice.gov/oig/reports/FBI/a0908/chapter4.htm).

[27] Gertler, Paul and Manisha Shah. 2011. "Sex Work and Infection: What's Law Enforcement Got to Do with It?," *Journal of Law and Economics* 54:811–840.

[28] Gertler, Paul, Manisha Shah, and Stefano M. Bertozzi. 2005. "Risky Business: The Market for Unprotected Commercial Sex," *Journal of Political Economy* 113:518–550.

[29] Jakobsson, Niklas and Andreas Kotsadam. Forthcoming. "The Law and Economics of International Sex Slavery: Prostitution Laws and Trafficking for Sexual Exploitation," *European Journal of Law and Economics.*

[30] Kara, Siddharth. 2009. *Sex Trafficking: Inside the Business of Modern Slavery.* New York, NY: Columbia University Press.

[31] Kotsadam, Andreas and Niklas Jakobsson. 2011. "Do Laws Affect Attitudes? An Assessment of the Norwegian Prostitution Law Using Longitudinal Data." *International Review of Law and Economics*, 31:103–115.

[32] Kristof, Nicholas D. 2006. "Legalizing Prostitution—A Solution?," *The New York Times*, December 20.

[33] Kurtz, Steven, Hilary Surratt, James Inciardi, and Marion Kiley. 2004. "Sex Work and 'Date' Violence," *Violence Against Women*, 10:357–385.

[34] Kristof, Nicholas D. 2012a. "How Pimps Use the Web to Sell Girls," *The New York Times*, January 25.

[35] Kristof, Nicholas D. 2012b. "Not Quite a Teen, Yet Sold for Sex," *The New York Times*, April 18.

[36] Lagon, Mark. 2009. "The Swedish Way—A Surprising Model for Chicago's Crackdown on Prostitution," *The Weekly Standard*, 16 November.

[37] *Las Vegas Sun.* 1998. "Pimps Force Underage Girls to Work in Nevada Brothels, Oregon Police Say," January 21.

[38] Lever, Janet, and Deanne Dolnick. 2000. "Johns and Call Girls: Seeking Sex and Intimacy." In *Sex for Sale: Prostitution, Pornography, and the Sex Industry*, edited by Ronald Weitzer. New York, NY: Routledge.

[39] Levitt, Steven D. and Sudhir A. Venkatesh. 2007. "An Empirical Analysis of Street-Level Prostitution." University of Chicago Working Paper.

[40] Organization of Economic Cooperation and Development. *Gender, Institutions and Development Database.* (Accessed on May 2, 2012, at http://stats.oecd.org/Index.aspx?DatasetCo de=GID2).

[41] Potterat, John J., Devon D. Brewer, Stephen Q. Muth, Richard B. Rothenberg, Donald E. Woodhouse, John B. Muth, Heather K. Stites, and Stuart Brody. 2004. "Mortality in a Long-Term Open Cohort of Prostitute Women," *American Journal of Epidemiology* 159:778–785.

[42] Rao, Vijayendra, Indrani Gupta, Michael Lokshin, and Smarajit Jana. 2003. "Sex Workers and the Cost of Safe Sex: The Compensating Differential for Condom Use among Calcutta Prostitutes." *Journal of Development Economics* 71:585–603.

[43] Rössler, Wulf, Ursula Koch, Christoph Lauber, A.-K. Hass, M. Altwegg, Vladeta Ajdacic-Gross, and K. Landolt. 2010. "The Mental Health of Female Sex Workers." *Acta Psychiatrica Scandinavica* 2010:1–10.

[44] Robinson, Jonathan, and Ethan Yeh. 2011. "Transactional Sex as a Response to Risk in Western Kenya." *American Economic Journal: Applied Economics* 3:35–64.

[45] Robinson, Jonathan, and Ethan Yeh. 2002. "Risk-Coping through Sexual Networks: Evidence from John Transfers in Kenya." *Journal of Human Resources* 47:107–145.

[46] Salmon, Andrew. 2004. "South Korea Targets Sex Trade, For Now," *The New York Times*, October 19.

[47] Simons, Marlise. 2008. "Amsterdam Tries Upscale Fix for Red Light District Crime," *The New York Times*, February 24.

[48] Smith, Craig S. 2005. "Turkey's sex trade entraps Slavic women," *The New York Times*, June 27.

[49] The Swedish Government. 2010. *Selected extracts of the Swedish government report SOU 2010:49:—The Ban against the Purchase of Sexual Services. An evaluation 1999-2008.* (Retrieved May 15, 2012, at http://www.turnofftheredlight.ie/wp-content/uploads/2011/02/Swedish-evaluation-full-trasnlation.pdf)

[50] The Swedish Police. 2009. "Människohandel för sexuella och andra ändamål. Lägesrapport 10. Rapport 2009:1" ["Human Trafficking for Sex and other purposes. Report 10."]. (Retrieved on May 15, 2012, at http://www.polisen.se/Global/www%20och%20Intrapolis/Rapporter-utredningar/01%20Polisen%20nationellt/Människohandel/Manniskohandel_lagesrapport_10_webb.pdf).

[51] United Nations Office on Drugs and Crime. 2006. *Trafficking in Persons: Global Patterns.* (Retrieved on June 28, 2012, at http://www.unodc.org/pdf/traffickinginpersons_report_2006-04.pdf).

[52] United Nations Office on Drugs and Crime. 2009. *Global Report on Trafficking in Persons.* (Retrieved on June 28, 2012, at http://www.unodc.org/documents/Global_Report_on_TIP.pdf).

[53] United States Department of State. 2009. *2008 Country Reports on Human Rights Practices.* February 25.

[54] Venkatesh, Sudhir. 2008. "Did Eliot Spitzer Get Caught Because He Didn't Spend Enough on Prostitutes?" *Slate Magazine*, March 12.

[55] Vogel, Ed. 1998. "Searching for Teen Prostitutes." *Law Vegas Review-Journal*, January 21.

[56] Weitzer, Ronald. 2012. "Sex Trafficking and the Sex Industry: The Need for Evidence-Based Theory and Legislation." *Journal of Criminal Law and Criminology* 104:1337-1370.

[57] Whaley, Sean. 2010. "State Lawmaker Plans To Continue Mission In 2011 To Combat Child Prostitution In Nevada," Nevada News Bureau, September 29.

[58] Woodward, Charlotte, Jane Fischer, Jake M. Najman, and Michael Dunne. 2004. *Selling Sex in Queensland.* Brisbane, Australia: Prostitution Licensing Authority.

Table 1: Prostitution Laws in Selected Countries

United States	**Illegal**	Prostitution is illegal in all states except Nevada, usually classified as a misdemeanor. Nevada allows licensed brothels in some rural counties.
Spain	**Legal**	The law does not regulate prostitution. Hence, it is essentially legal. Pimping is illegal. Owning an establishment where prostitution takes place is not in itself illegal, but the owner cannot derive financial gain from the prostitute or hire a person to sell sex.
Sweden	**Criminalizing the john**	It is illegal to buy sexual services, but not to sell them. Pimping, procuring and operating a a brothel are also illegal. Norway, Iceland and South Korea adopted similar legislations.
Netherlands	**Legal and regulated**	Prostitution is legal. Operating a brothel is also legal. Licensed private brothels. Prostitutes are entitled to work permits.
Germany	**Legal and regulated**	Prostitution is legal. Prostitutes can require work permits. Brothels allowed without licensing. Street/apartment/call service prostitution permitted. Prostitutes have to pay income taxes and have to charge value-added taxes for their services. Cities have the right to zone off certain areas where prostitution is not allowed.
Thailand	**Illegal**	Prostitution is illegal but there are many illegal brothels. Many foreigners travel to Thailand for sex tourism.
Iran	**Illegal**	Severe penalties exist for the prostitute, including stoning to death. Less severe penalties exist for the john, such as flogging.
Japan	**Partly illegal**	Prostitution is defined as only coitus. The law prohibits the trade of coital sex, but it does not penalize those acts. It penalizes soliciting in public places and pimping, but enforcement is lax. The trade of non-coital sexual services, such as oral or anal sex, is not illegal.

Table 2: Most Common Destination Countries for Sex Trafficking

Country	Prostitution law
Belgium	Legal
Germany	Legal and regulated
Israel	Legal
Italy	Legal
Japan	Partly illegal
Netherlands	Legal and regulated
Thailand	Illegal
Turkey	Legal and regulated
United States	Illegal

Table 3: Female-Male Income Ratios, Prostitution Laws, and Prostitution

OECD Country	Female-male income ratio	Prostitution law code	Average law code	Men having paid for sex (percent)	Avg. GDP* (trillion $)	Avg. prost. revenue* (billion $)
Sweden	0.84	2		13.6		
Norway	0.79	2		12.9		
Denmark	0.74	1		-		
Iceland	0.73	2		-		
Australia*	0.73	1		15.6		
Finland	0.72	1	1.00	13.0		
New Zealand	0.72	0		-		
United Kingdom*	0.7	1		8.8		
Israel*	0.67	1		-	3.26	3.8
Hungary	0.67	0		-		
Netherlands*	0.66	0		21.6		
Switzerland*	0.66	0		19.0		
Canada	0.65	1		-		
United States*	0.64	2		20.0		
Estonia	0.63	1		-		
France	0.62	1		16.0		
Slovenia	0.62	0	0.75	-		
Portugal	0.61	1		-		
Germany*	0.61	0		-		
Czech Republic*	0.6	0		-		
Poland	0.6	1		-		
Slovak Republic	0.59	1		-		
Ireland	0.58	1		-		
Luxembourg	0.55	1		-		
Spain*	0.53	0		39.0		
Greece	0.53	0		-		
Korea*	0.52	2		-	2.01	12.2
Belgium	0.52	0		-		
Italy*	0.49	0	0.27	45.0		
Japan*	0.46	0		37.0		
Mexico	0.42	0		-		
Chile	0.41	0		-		
Austria	0.4	0		-		
Turkey*	0.28	0		-		